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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/837,714	04/18/2001	Daniel A. Japuntich	48317US032	9172
32692 7590 04/19/2007 3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427			EXAMINER BRANDT, ADAM CURTIS	
			ART UNIT	PAPER NUMBER
			3771	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/19/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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**Office Action Summary**

Application No.

09/837,714

Applicant(s)

JAPUNTICH ET AL.

Examiner

Adam Brandt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 33, 35-42, 44, 46, 49, 50, 55-59, 64-66 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/29/2007 has been entered. Presently claims 33, 35-42, 44, 46, 49, 50, 55-59, and 64-66 are pending in the application.

### ***Information Disclosure Statement***

2. This office acknowledges receipt of the following items from the applicant: Information Disclosure Statement (IDS) filed 10/5/2006. The references cited on the PTO 1449 form have been considered.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 33,39,40,44,46,49,50,55-59,64,65 rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson et al. ('516) in view of Cover ('183) and Soderberg (EP 0 252 890).

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As to claim 33, Simpson et al. disclose a method of making a filtering face mask which method comprises: providing a valve seat that comprises an orifice (16) and a seal surface, wherein the orifice allows exhaled air to pass through and being surrounded by the seal surface; and a single flexible flap (15), supporting the single flexible flap non-centrally and operatively relative to the orifice of the valve seat to form an exhalation valve and attaching the exhalation valve to the mask body that is adapted to fit over the nose and mouth of a person (fig.1).

The differences between Simpson et al. and claim 33 are supporting the single flexible flap such that the flap assumes, in its closed state, a curved profile in a cross-sectional view thereof, which the curved profile comprises a curve that extends from a first point where a first stationary portion of the flexible flap is supported on the valve seat to a second point where a second free portion of the flap is pressed against the seal surface of the valve seat in a closed state of the exhalation valve, and the second free portion of the flexible flap is held in its closed state under any orientation of the valve, at least in part, by virtue of the curved profile thereof; and the second free portion of the flexible flap represents the only free portion of the flap and can flex so as to permit exhaled air to pass through the orifice and to provide an open state of the exhalation valve to make the flexible flap out of contact with the seal surface at the second point while the first portion of the flexible flap remains essentially stationary at the first point.

Cover (page 2, col.1, lines 3-6, lines 15-17, lines 22-33, lines 48-51) teaches supporting the single flexible flap (23) such that the flap assumes, in its closed state, a curved profile in a cross-sectional view thereof (figs.1,2,4), which the curved profile comprises a curve that extends from a first point (21,25,26) where a first stationary portion of the flexible flap is supported on the valve seat to a second point where a second free portion of the flap is pressed against the seal

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surface of the valve seat in a closed state of the exhalation valve, and the second free portion of the flexible flap is held in its closed state under any orientation of the valve, at least in part, by virtue of the curved profile thereof; and the second free portion of the flexible flap represents the only free portion of the flap and can flex so as to permit exhaled air to pass (page 2, col.1, lines 44-48) through the orifice and to provide an open state of the exhalation valve to make the flexible flap out of contact with the seal surface at the second point while the first portion of the flexible flap remains essentially stationary at the first point. Cover teaches this valve configuration for the purpose of improving the closing action of the valve flap, improving the retention of the valve flap in effective registration with the apertures of the valve seat and causing the valve flap to function more efficiently.

It would have been obvious to modify the shape of the valve seat of Simpson et al. to have a curved profile when viewed from a side elevation because it would have improved the closing action of the valve flap, improved the retention of the valve flap in effective registration with the apertures of the valve seat and caused the valve flap to function more efficiently as taught by Cover.

To the extent, if any, that the valve flap of Simpson et al. as modified by Cover may not be held in its closed state under any orientation of the valve, at least in part, by virtue of the curved profile, resort is had to Soderberg (page 4, lines 13-23) which teach a rubber valve membrane having a beveled edge (12) that will seal against the valve seat (3) irrespective of position assumed by the valve device. It would have been obvious to further modify the edge of the valve membrane of Simpson et al. to include a beveled edge to aid in maintaining a seal with the valve seat under any orientation of the valve device as taught by Soderberg.

As to claims 39 and 40, the flap retaining surface of Simpson et al. (fig.2) is illustrated as being positioned adjacent one side of the orifice (16) and is oriented transversely (i.e. inasmuch as the retaining surface extends across one side of the orifice) relative to the orifice (16).

As to claim 44, the shape of the orifice (16) of Simpson et al. does not fully correspond to the shape of the seal surface and the flexible flap (15) is mounted to the valve seat in cantilever fashion.

As to claim 46, the curvature of the flexible flap of Simpson et al. as modified by Cover extends from a plurality of points where the flap is affixed to the valve seat to a plurality of points which are opposite the plurality of points on the fixed portion of the flexible flap (e.g. figs.1,2,4 of Cover).

As to claim 49, the relative dimensions and spacing of the constituents of the exhalation valve of Simpson et al. can be arrived at through mere routine obvious experimentation and observation with no criticality seen in any particular relative spacing including 1-3.5 mm between the flap retaining surface and the orifice because of the use of different sizes of valves in an effort to accommodate different sized wearers.

As to claim 50, the particular material from which the valve seat of Simpson et al. is made and the manner of making the valve seat can be arrived at through mere routine obvious experimentation and observation with no criticality seen in any particular material including a relatively light weight plastic. Inasmuch as Simpson et al. (page 2, lines 37-65) disclose the valve flap being made from plastic and/or rubber material, it would have been obvious to make the valve seat from any well known material which would achieve known or expected results

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including a plastic and/or rubber material because the use of a valve seat of the same material as the valve flap would have provided for more effective physically cooperation.

As to claim 56, the particular dimensions, the particular material including the hardness of the material of the flexible flap (15,14) of Simpson et al. can be arrived at through mere routine obvious experimentation and observation with no criticality seen in any particular dimensions nor in any particular constituency.

As to claim 55, the second free portion of the flexible flap of Simpson et al. as modified by Cover has a profile that when viewed from the front corresponds to the general shape of the seal surface and comprises a curve (figs.1,2,4 of Cover).

As to claim 57, while Simpson et al. is silent as to the relative surface areas of the fixed and free portions of flap (15), it is submitted that the particular relative amounts of the fixed and free portions can be arrived at through mere routine obvious experimentation and observation with no criticality seen in any particular relative amounts including 10-25% fixed and 75-90% free.

As to claim 58, the flexible flap of Simpson et al. is positioned on the valve such that exhaled air deflected downward during an exhalation when the filtering facemask is worn on a person (fig.1 of Simpson et al.).

As to claim 59, Simpson et al. (page 1, lines 116-123) disclose the mask body is cup-shaped and comprises at least one shaping layer for providing structure to the mask, and a filtration layer, the at least one shaping layer being located outside of the filtration layer on the mask body.

As to claim 64, the exhalation valve of Simpson et al. (fig.1) is positioned on the mask body substantially opposite to a wearer's mouth and such that the second free portion of the flexible flap resides beneath the stationary portion when the mask is worn on a person.

New claims 65 and 66 are substantially equivalent in scope to claim 33 and are included in Simpson et al. as modified by Cover for the reasons set forth above with respect to claim 33.

5. Claims 35-38,41,42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson et al. ('516) in view of Cover ('183) and Soderberg (EP 0 252 890) as applied to claims 33,39,40,44,46,49,50,55-59,64,65 above, and further in view of Shindel ('277).

The difference between Simpson et al. as modified by Cover and claim 35 is securing a valve cover to the valve seat, wherein the valve seat includes a flap-retaining surface, and the flap-retaining surface is located within an internal chamber defined by the valve cover.

Shindel (col.2, lines 59-66) teaches a valve securing device in the form of a valve cover (7) that is disposed over the valve seat and that comprises a surface (14) that mechanically holds flexible flap (6) against the flap retaining surface (5) in an abutting relationship therewith when a fluid is not passing through the orifice under any orientation of the valve, the point where the flexible flap is mechanically held against the flap retaining surface being located off center (fig.2) relative to the flap. Shindel cites the advantages of simplicity of arrangement and ready removability of the cover when desired which would allow for replacement and/or cleaning of the valve and orifices.

It would have been obvious to further modify the manner of attachment of the exhalation valve of Simpson et al. to employ a cover over the valve seat because it would have provided a

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simple arrangement with ready removability of the cover when desired and because it would have provided protection for the exhalation valve as taught by Shindel.

As to claim 42, the flexible flap of Simpson et al. as modified by Cover (page 1, col.2, lines 41-43 and figs.1,2,4) would normally assume a flat configuration (Cover expressly discloses the valve flap 23 is formed from a thin sheet of flexible and resilient rubber material) but is curved by virtue of its securement of the flap to the valve seat and the relative positioning and alignment between the seal surface and the flap retaining surface.

As to claims 36 and 37, the first stationary portion of the flexible flap of Simpson et al. as further modified by Shindel is held (via mechanical clamping) between the flap retaining surface (#5 of Shindel) on the valve seat and a second member (#14,15 of Shindel) that is associated with the valve cover when the valve cover is secured to the valve seat.

As to claim 38, the flexible flap of Simpson et al. as modified by Cover (figs.1,2,4) and Shindel teaches that the flexible flap can assume a curved profile, when in its closed state, that extends in from where the flexible flap contacts the second member (#5 of Shindel) of the valve cover to where the second portion of the flexible flap contacts the seal surface of the valve seat.

As to claim 41, the flexible flap of Simpson et al. as modified by Cover (page 1, col.2, lines 41-43 and figs.1,2,4) would normally assume a flat configuration (Cover expressly discloses the valve flap 23 is formed from a thin sheet of flexible and resilient rubber material) but is curved by virtue of its securement of the flap to the valve seat and the relative positioning and alignment between the seal surface and the flap retaining surface.

***Response to Arguments***

6. The Examiner acknowledges the amendment to the abstract and has verified the amendments dated 4/18/2001 and 1/2/2003 that rectified the objection to the missing numbers in the drawings. Objections to the specification and drawings have been removed.

7. Applicant's arguments filed 2/28/2007 have been fully considered but they are not persuasive.

Applicant argues that the rejection made under 35 U.S.C. 103(a) Simpson et al. (GB 2,072,516) in view of Cover (2,105,183) and Soderberg (EP 0252890) is not proper because there is no teaching for such a combination in the references. Simpson discloses a cantilevered flexible flap assembly in figure 2. Simpson does not show the flexible flap assembly in a closed state with a curved profile in a cross sectional view. Cover teaches a single flexible flap with a curved profile that meets the limitations of the claims. The motivation to make such a combination comes directly from Cover's disclosure. Cover recites, "...it is desirable to have as efficient closing action and closing registration between the movable element and the apertures of the base plate as is possible, so as to seal off the outside air as much as possible and of course it is also desirable to have as efficient an opening action of the valve as is possible. By the arrangement of my preferred form with the features of the concave oval base and the arrangement of the hinging means, I have accomplished a highly improved valve structure." Cover acknowledges that the concave base improves the performance of the device in conjunction with movable element and the apertures. These benefits provide the motivation to combine Simpson et al. and Cover.

Applicant argues that Cover does not improve the closing action of the valve. The Applicant has provided evidence to discredit the statements made by Cover. Testing between the present invention and a valve similar to Cover was conducted that concluded that the present invention could function at a lower pressure drop and provided lower airflow resistance. The Examiner contends that the data provided by the applicant is for a comparison between the present invention and the device of Braun. The Applicant is supposing that because of the general operating similarities of Braun's valve and Cover's valve, it is adequate to believe the two valves will function similarly enough to draw a clear conclusion. The Examiner believes that such an experiment provides inconclusive evidence because a valve that shares few operational characteristics is not an equivocal substitute for the actual valve as taught by Cover.

The Applicant argues that Braun's disclosure presents the state of the art and that Braun acknowledges that prior art has struggled to display a dual flap system mounted at one end. The Applicant surmises that such an arrangement has troubles in retaining the flap in a closed position in any orientation. The Applicant quotes from column 3, lines 40-43, "...If the flap is too long, it might not have sufficient resilience to become quickly seated to resist extraneous unseating forces." Focusing on the preceding lines 36-40, Braun states, "To attain the lowest pressure drop across a novel valve which has been constrained in width by the space between cheek filters, the orifice and flap are usually as long as possible within the available frontal area, thus minimizing the pressure drop." The Examiner interprets Braun's disclosure as being cautionary advice in the design of such a valve. Braun does not say that it is not possible to design a valve that is longer than any ordinary valve, but warns that too long a flap may not have the required resilience to return to a closed position. Additionally, the dimension of the flap is

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relative to that of the valve opening. A smaller valve opening will require a smaller flap that in relation to a typical flap would not be considered "too long". While one of ordinary skill in the art can appreciate Braun's design advice, it should not be considered to be the definitive teaching of valve technology at the time the of the invention.

Applicant argues that Cover does not disclose the claimed structure. The Examiner takes the position that when interpreted broadly, the rejection found in office action dated 12/28/2006 meets the limitations of the claim.

Applicant argues that Simpson does not lend itself to be modified by Cover and that Simpson teaches away from any such combination. The Examiner acknowledges the deficiencies of Simpson. Simpson includes the antechamber as a measure to prevent the breathing of toxic gas. Such a deficiency is ideal motivation to modify Simpson with the teachings of Cover. If Simpson's flexible valve does in fact lack the resilience required to remain closed in any orientation, Cover provides the obvious improvement to remedy the alleged non-resilient valve. The Applicant argues that Cover's centrally located mounting system is problematic in that if the flexible flap was mounted on one side, the valve would fail to function. The claim limitation requires the valve to be non-centrally located. This limitation does not require the flap to be at one side of the valve system. Therefore, if the mounting system of Cover was moved slightly off center, which most likely could be done without greatly affecting the performance of the valve, then it would no longer be centrally located. Once again, it is the office's position that the Examiner interprets all claims as broadly as possible. Therefore, the rejection is deemed proper.

As to the Applicant's arguments directed towards the combination including Soderberg, Soderberg is teaching a beveled edge that improves the ability of a valve to seal. This is only an improvement to the modified Simpson combination and such a feature is well known in the art. Braun discloses a beveled edge (18, column 3, lines 3-5) to increase the valves proficiency for creating a secure relationship. One of ordinary skill in the art would appreciate the inclusion of a beveled edge in a flap type valve since it has been established that such a feature is routinely added to increase the sealing performance of the valve.

The Applicant argues that the Examiner has selectively chosen elements to assemble an amalgam of ideas that meets the limitations of the claims. The Examiner has shown motivation to combine Simpson and Cover, and additionally Soderberg. The proposed combination suggested by the Examiner does meet the limitations of the claims when interpreted broadly. Braun's teaching are considered relevant to the state of the art at the time of the invention, but is not considered to be the definitive teaching of all known valve technology. The Examiner believes that the combination of references does not selectively pick needed elements, but considers the references as a whole. The rejection is maintained.

### *Conclusion*

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 6,923,181 to Tuck and US 6,513,519 to Gallem both relate to valves used for respiration purposes that feature biased flaps.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adam Brandt whose telephone number is 571-272-7199. The examiner can normally be reached on 8:30 AM to 4:30 PM; Mon thru Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Justine Yu can be reached on 571-272-4835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*ACB*  
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Adam Brandt  
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Art Unit 3771



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4/16/07